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— At a recent meeting of the Deutsche gesellschaft für natur und völkerkunde Ostasiens, Dr. H. Fesca gave a paper on the agricultural circumstances of Japan in general, and of the province of Kai in particular. In the opinion of the author, wages in Japan are not less than in western Europe, especially in Germany. To this Dr. Wagner agreed, and added that apparent exceptions could always be traced back to purely local conditions. For instance, in many places porcelain was manufactured very cheaply, because the clay was prepared by the peasants quite incidentally; on their way to the field they took a basketful of clay from a pit in the neighborhood, delivered the raw material to a pounder driven by water found on the way, and on their return carried for little pay the ready pounded clay to a manufacturer. In the same way, Mr. Netto said, in many places gold is washed, where a regular trade would by no means pay; on rainy days, or when for any reason field work is interrupted, the people go to washing gold, since other work is not at hand.

— Concerning the little filaments of ice that appear on the surface of the soil after the first frost succeeding a heavy rain, W. Prinz (*Ciel et terre*, July, 1885) states that they are pressed out from the soil through small openings by the expansion of water in the ground as freezing proceeds. The size of the filaments depends upon the size of the openings through which they have been forced by expansion from behind, and the flutings with which they are covered correspond with irregularities in the walls of the openings through which they are forced.

— New Grenada possesses agricultural and mineral resources of the first order, which the opening of the routes across Panama will no doubt develop. The lower valley of the Magdalena, it is true, being formed of impermeable ground kept very moist by forests, is a seat of malaria and of yellow fever. The high valley of Honda is better favored, being much more permeable, less woody, and unvisited by miasma and fever. In revenge, however, the Indians and native blacks live in fear of leprosy, and all races are liable to the curious carathé, a disease which discolours the skin in places, more particularly the face, hands and feet. On the sides of the mountain, however, the climate is much more agreeable and very healthy. The population of New Grenada, a mixture of Spaniards, negroes and Indians, is about 2,000,000, and is spread over a territory much greater than that of France.

— At the Aberdeen meeting of the British association Lieutenant-colonel Playfair referred to the fact that the remains of magnificent Roman farms

were to be found on the sandy plains of Tunis. The little hillsides were now nothing but sand, for the vegetable mould which once covered them has been washed away, and may now be found in the neighboring valleys buried beneath some feet of sand and water. No more striking instance of the importance of preserving forests could, in his opinion, be found.

WASHINGTON LETTER.

The society of science in Washington has its 'season' nearly as well defined as that of fashion, and almost coincident with the departure of the votaries of the latter is the setting out to various quarters of the globe of the representatives of the former. Not all, but a very considerable number of the scientific men of the capital are 'in the field' during the summer months, but they are there for work and not for pleasure, except such as is naturally incident to their more serious occupations. Just now they are beginning to reappear; the various scientific bureaus are taking on an appearance of initial activity, and the rooms of the Cosmos club, in which the various elements that go to make up human knowledge are wont to hold high carnival, are gradually losing that lonesome and deserted appearance which has been their chief characteristic for some months. It is to be presumed that these laborers have brought their harvest with them, and that during the coming winter they will be busily occupied in its threshing and winnowing, and in its dedication to the public good through the public printer.

In the meantime the home contingent has not been extremely small, nor has it been entirely idle. It is safe to say that in at least one case, that of the coast and geodetic survey, the affairs of the central office have, to an unusual degree, occupied the thoughts of those connected with it, and, indeed, of many others who are interested in the true welfare of government scientific work. Among such, general satisfaction was expressed with the action of the administration in the selection of Professor Agassiz as its superintendent, and great disappointment that he felt constrained to decline the responsibility. Under decidedly unfavorable conditions most of the regular work of the survey has gone on without serious interruption. One of the veteran observers of this corps, Mr. George W. Dean, was in the city a day or two recently, having returned from a longitude campaign at Colorado Springs and various connecting points.

In the geological survey, while the geologists, topographers, etc., have spent the summer in the field, the chemical laboratory under Professor

Clarke has been almost constantly in active operation. Mr. Hallock has spent some time at the Watertown arsenal, utilizing its great testing machine in certain important pressure experiments. This work will be continued, and will include a repetition of some experiments already made by others under less favorable conditions as well as a number of new researches. The survey has recently published Bulletin No. 14, on 'the physical characteristics of the iron-carburets, etc.,' the joint work of Carl Barus and Vincent Strouhal. This treats especially of the electrical and magnetic properties of steel and cast iron, and is a really valuable contribution to our knowledge of these important metals. Much of the work was done while Mr. Barus was in Europe working in conjunction with Strouhal; some of it has been previously published in certain European journals. Many additions have been made, however, by Mr. Barus since his connection with the survey, and the whole now appears for the first time in English, in a volume of more than two hundred pages.

Professor Riley of the Department of agriculture is now revising the final proof sheets of the 'Fourth report of the U. S. entomological commission.' This report is on the cotton worm, being the final report on the same, together with a chapter on the boll worm. It will contain sixty-four plates and about five hundred pages of text. Three thousand copies have been ordered printed by congress. The preparation of this report was virtually completed in 1882. A part of the delay in its publication is due to a desire on the part of the entomologist to complete some special researches, and especially to obtain a more exact knowledge of the facts in reference to *Aletia* in Brazil, as bearing on the hibernation and introduction of the species within the States. To this end Dr. John C. Branner was sent to Brazil, remaining there about four months and returning with a large amount of interesting material, which has been utilized in the report. Again, the work of the preparation of this volume has necessarily been made secondary to that of the entomologist in a general way, including the issue of special bulletins and annual reports. But no small portion of the delay is to be attributed to the difficulties incident to the publication of such scientific reports by the government. During the winter season when the authors of scientific papers can naturally give more attention to their publication, the public printer finds it necessary to devote the energies of his establishment to the printing of miscellaneous congressional and other public documents. In the summer the naturalist is in the field, occupied with the prosecution of research, and has little leisure for liter-

ary or editorial labors. Yet it is a fact that the report was formally submitted in March, 1884, the bulk of it was in type and the illustrations prepared by the fall of that year. It is to be hoped that no further delays will prevent its being placed in the hands of the public at an early date.

The entomological commission, consisting of Professors Riley, Packard and Cyrus Thomas, has now prepared four large volumes, three of which have been published, one is about to be issued, and a fifth is in preparation. The whole embodies the results of the work of the commission, which has been in existence about five years.

The naval observatory has just issued its annual volume containing the 'Washington observations for 1881.' Besides the usual astronomical and meteorological observations, it contains two appendices by Professor Hall, one on the satellites of Uranus, and the other on the satellite of Neptune. It is pleasant to reflect that these publications are of permanent and lasting value. Their tardy appearance would otherwise seriously interfere with their usefulness. No systematic study of the new star in Andromeda has been made at the observatory. It has been examined from time to time by several of the astronomers, and a few measurements of position have been taken. The navy department is engaged in the construction of a magnetic observatory in the grounds of the naval observatory. It is understood to be under the charge of the bureau of compasses.

A seismological conference was held in the office of the director of the geological survey about a year ago, in which were representatives from the survey, the signal service, the naval observatory, and a few persons not in government employ, who have long been interested in seismology. The proceedings were noticed at length in this journal at the time. The explosion of a vast amount of dynamite at Flood Rock offered an opportunity for the study of what might be called an artificial earthquake, and it was determined to take advantage of it and make such observations as were found to be possible. The uncertainty as to the exact time of the explosion, and the difficulty of obtaining information concerning it, prevented such complete preparation as would have been desirable and possible under other circumstances. Circulars were sent, however, to directors of astronomical observatories in the neighborhood of New York City, requesting co-operation, and by direction of the director of the geological survey, the chief signal officer and the secretary of the navy, Professors Clarke, Mendenhall, and Paul, will go to New York, to utilize in the best possible manner the instrumental appliances at hand. Several seismoscopes are nearly completed, and a seismograph well under way for

the use of the organization referred to above, but the limited time will not permit of their being gotten ready for use on this occasion. The results of the observations made will be looked for with interest.

At the national museum the employés have been busy for some time in arranging the exhibits received from the New Orleans exposition. Many of these were sent from the museum originally, and are only now being returned to their places; but many were not, and, in fact, it is stated that the museum has been a great gainer in the operation. It is said that one thousand boxes were sent to New Orleans, and that two thousand have been received from there, all of which goes to prove that the officers of the museum, and particularly its representatives at New Orleans, are alive to the interests of the great and rapidly growing collection, and is also conclusive evidence that a rolling stone *does* sometimes gather moss. Z.

Washington, D. C., Oct. 5.

LETTERS TO THE EDITOR.

. Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.

The color of the sky.

I read with interest the communication of Prof. E. L. Nichols on the above subject published in *Science* September 11. As the views there expressed (that the color is really only a subjective phenomenon) run quite counter to those generally held, it seemed desirable if possible to confirm or disprove them. Everyone who has used a spectro-photometer is well aware that it is an instrument with which it is impossible, even when most carefully handled, to obtain results of great precision. It, therefore, seemed to me preferable to compare directly the colors of the sky, and the illuminated sheet of paper.

For this purpose I employed a polarimeter, consisting of a tube furnished with a double image prism at one end, and a revolving Nicol prism at the other. Before it, in the sunlight, was laid a mirror, half of which was covered with a sheet of white paper. Between these and the instrument was placed a sheet of black paper suitably screened from the sunlight, and containing two square holes, through one of which the illuminated paper was seen, and through the other the blue sky reflected in the mirror. The instrument was then used in the ordinary manner, being so placed that one of the images of the illuminated paper was in contact with the oppositely polarized image of the reflected sky. The Nicol was then turned till the two were of the same brilliancy, and the colors compared. There was no question but the sky was decidedly the bluer of the two. The tube carrying the double-image prism was then rotated about its axis through 180° , to allow for any difference of color which might have been introduced by the polarization, no appreciable change, however, was noted. The white paper was next removed, and some of a bluish tint substituted, but it was not until paper of a decided sky blue color was employed, that an accurate match could be obtained. Since then the color of the reflected sky matches that

of blue paper illuminated by direct sunlight, and does not match that of white paper so illuminated, it seems clear that the color of the sky is something distinctly inherent to itself, and is not a subjective phenomenon as supposed.

Further evidence bearing upon this subject, collected by Prof. E. C. Pickering from polarimetric observations of the sky will be found in the *Proceedings of the American academy*, vol. ix., p. 20.

WM. H. PICKERING.

Woodhead and Hare's 'Pathological mycology.'

Permit me to add a few corrections to those recently made by a correspondent concerning this publication, (*Science*, Aug. 14). The authors state on p. 17 that "in artificial media it is a frequent experience to find organisms destroyed by the virulence of their own products before all food material has been exhausted." I doubt very much whether this observation has ever been made. *A priori* it seems unreasonable to suppose that bacteria would commit suicide so speedily. It is well known that the products of fermentation may check the process after a time, but the organisms survive for some time after. Pasteur's method of attenuating the virus of fowl cholera depends on the act of allowing months to elapse before a new culture is made. I have still to find a microbe which dies in a liquid medium within, at least, two months after inoculation.

The authors seem to think that when fluids are not albuminous they will not adhere to the coverglass when dried and heated, hence the method of irrigation is recommended (p. 46). As the method of staining on the coverglass is of fundamental importance, it seems strange that such a statement should be made. In fact the dried layer from albuminous fluids is very apt to be washed away, while the ordinary 'broth,' from which probably all albumen has been precipitated by heat in sterilizing, always forms a firm layer. I doubt whether any one will succeed well in staining and washing bacteria by irrigation. They will, very likely, find their way to the blotting-paper used to stimulate the current. Had the authors followed Koch, as closely here as elsewhere, this error would not have occurred, as he is very explicit on this point.

In the formula, for Cohn's fluid given on p. 111 'as recently modified,' we find, by comparing with the most recent foreign publications (Zopf, Flügge, Hüppe, Cornil and Babes) that the quantity of all the salts but one is from ten to twenty times too great. It would be desirable to know to whom the modification is due. I do not believe that bacteria, parasitic or saprophytic, would appreciate such a concentrated solution.

There are many indications throughout the work that the methods and processes described were not fully mastered by the authors themselves. Thus, on p. 75, filters are to be washed with 'boiled distilled water,' even though the filtered gelatine must be subsequently sterilized by steaming the stock flasks for fifteen minutes (p. 76) which is, at least, five minutes too long, and would certainly ruin the gelatine. After removing the potatoes from a solution of mercuric chloride (p. 62), why not rinse them in boiled distilled water, where its employment might do some good? Finally, the use of caustic potash or turpentine for cleaning slides (p. 51) seems a rather unpardonable suggestion.

THEOBALD SMITH.